

Claims

- [c1] 1.A downhole sampling tool for sampling a formation fluid from a subterranean formation, comprising:
a probe for drawing the formation fluid from the subterranean formation into the downhole tool;
a main flowline extending from the probe for passing the formation fluid from the probe into the downhole tool;
at least one sample chamber operatively connected to the main flowline for collecting the formation fluid therein; and
an exit flow line operatively connected to the sample chamber for selectively removing one of a contaminated portion of the formation fluid, a clean portion of the formation fluid and combinations thereof from the sample chamber whereby contamination is removed from the formation fluid.
- [c2] 2.The sampling tool of claim 1 wherein the tool is selected from the group of wireline tool, drilling tool, coiled tubing tool and combinations thereof.
- [c3] 3.The sampling tool of claim 1 wherein the at least one sample chamber comprises a first sample chamber and a second sample chamber, the downhole tool further com-

prising a transfer flowline for passing at least a portion of the formation fluid from the first sample chamber to the second sample chamber.

- [c4] 4.The sampling tool of claim 1 wherein the exit flow line is operatively connected to a second sample chamber for passing at least a portion of the formation fluid from the first sample chamber to the second sample chamber.
- [c5] 5. The sampling tool of claim 1 further comprising a dump flowline for passing fluid from the main flowline to the borehole.
- [c6] 6.The sampling tool of claim 1 further comprising sensors for detecting formation parameters.
- [c7] 7.The sampling tool of claim 6 wherein the sensors are positioned in at least one of the flowlines, the at least one sample chambers and combinations thereof.
- [c8] 8.The sampling tool of claim 1 further comprising a fluid analyzer capable of monitoring contamination of the formation fluid.
- [c9] 9.The sampling tool of claim 1 further comprising a fluid separator.
- [c10] 10.The sampling tool of claim 9 wherein the fluid separator comprises one of pebbles, chemicals, catalysts, ac-

tivators, demulsifiers and combinations thereof.

- [c11] 11.The sampling tool of claim 1 wherein the at least one sample chambers have a piston slidably movable therein, the piston separating the sample chamber into a sample cavity and a buffer cavity.
- [c12] 12.The sampling tool of claim 1 wherein the exit flowline extends from the at least one sample chamber to the borehole for dumping contaminated fluid from the sample cavity into the borehole.
- [c13] 13.The sampling tool of claim 1 wherein the exit flowline extends from the at least one sample chamber to a collection chamber for collecting the formation fluid.
- [c14] 14.The sampling tool of claim 1 wherein the exit flowline is provided with a snorkel positionable in the sample chamber for selective removal of at least a portion of the formation fluid therefrom.
- [c15] 15.The sampling tool of claim 1 further comprising a gas accumulator operatively coupled to the main flowline, the accumulator capable of allow gas bubbles to group together before passing into the sample chamber.
- [c16] 16.A method for sampling a formation fluid from a subterranean formation via a downhole tool, the method

comprising:

positioning a downhole tool in a wellbore;

establishing fluid communication between the downhole tool and the surrounding formation;

drawing fluid from the formation into the downhole tool;

collecting the formation fluid in at least one sample chamber; and

withdrawing one of a contaminated portion of the formation, a clean portion of the formation fluid and combinations thereof from the sample chamber.

[c17] 17.The method of claim 16 further comprising separating the clean portion of the formation fluid from the contaminated portion of the formation fluid.

[c18] 18.The method of claim 17 wherein the fluid is separated by withdrawing the contaminated portion from the sample chamber.

[c19] 19.The method of claim 17 wherein the fluid is separated by one of allowing it to settle, agitation, additives and combinations thereof.

[c20] 20.The method of claim 19, wherein the additives are pebbles, demulsifiers and combinations thereof.

[c21] 21.The method of claim 16 wherein the fluid is separated by transferring the clean portion into a collection

chamber.

- [c22] 22.The method of claim 16 wherein the contaminated portion is dumped into the borehole.
- [c23] 23.The method of claim 16 further comprising identifying one of a clean portion of the formation fluid, a contaminated portion of the formation fluid and combinations thereof.
- [c24] 24.A sampling system for removing contamination from a formation fluid collected by a downhole tool from a subterranean formation, comprising:
at least one sample chamber positioned in the downhole tool for receiving the formation fluid; and
an exit flow line operatively connected to the sample chamber for selectively removing one of a contaminated portion of the formation fluid, a clean portion of the formation fluid and combinations thereof from the sample chamber whereby contamination is removed from the formation fluid.
- [c25] 25.The sampling system of claim 24 wherein the tool is selected from the group of wireline tool, drilling tool, coiled tubing tool and combinations thereof.
- [c26] 26.The sampling system of claim 24 wherein the at least one sample chamber comprises a first sample chamber

and a second sample chamber, the sampling system further comprising a transfer flowline for passing at least a portion of the formation fluid from the first sample chamber to the second sample chamber.

[c27] 27. The sampling system of claim 24 wherein the exit flow line is operatively connected to a second sample chamber for passing at least a portion of the formation fluid from the first sample chamber to the second sample chamber.

[c28] 28. The sampling system of claim 24 further comprising a dump flowline for passing fluid from the main flowline to the borehole.

[c29] 29. The sampling system of claim 24 further comprising sensors for detecting formation parameters.

[c30] 30. The sampling system of claim 29 wherein the sensors are positioned in at least one of the flowlines, the at least one sample chambers and combinations thereof.

[c31] 31. The sampling system of claim 24 further comprising a fluid analyzer capable of monitoring contamination of the formation fluid.

[c32] 32. The sampling system of claim 24 further comprising a fluid separator.

- [c33] 33.The sampling system of claim 32 wherein the fluid separator comprises one of pebbles, chemicals, catalysts, activators, demulsifiers and combinations thereof.
- [c34] 34.The sampling system of claim 24 wherein the at least one sample chambers have a piston slidably movable therein, the piston separating the sample chamber into a sample cavity and a buffer cavity.
- [c35] 35.The sampling system of claim 24 wherein the exit flowline extends from the at least one sample chamber to the borehole for dumping contaminated fluid from the sample cavity into the borehole.
- [c36] 36.The sampling system of claim 24 wherein the exit flowline extends from the at least one sample chamber to a collection chamber for collecting the formation fluid.
- [c37] 37.The sampling system of claim 24 wherein the exit flowline is provided with a snorkel positionable in the sample chamber for selective removal of fluid therefrom.
- [c38] 38.The sampling system of claim 24 further comprising a gas accumulator operatively coupled to the main flowline, the accumulator capable of allow gas bubbles to group together before passing into the sample chamber.